DOCUMENT RESUME

ED 028 283 08 VT 008 055

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A Guide for Planning Facilities for Occupational Preparation Programs for Medical X-Ray Technicians. Research 31.

Ohio State Univ., Columbus. Center for Vocational and Technical Education.

Spons Agency-Office of Education (DHEW), Washington, D.C.

Bureau No-BR-7-0158

Pub Date Apr 69

Grant-OEG-3-7-000158-2037

Note-61p.

Available from-The Center for Vocational and Technical Education, The Ohio State University, 1900 Kenny Road, Columbus, Ohio 43210 ($2.00)

EDRS Price MF-$0.50 HC-$3.15

Descriptors-Annotated Bibliographies, *Educational Facilities, Educational Planning, Educational Specifications, *Facility Guidelines, Facility Requirements, Health Occupations Education, Instructional Programs, *Laboratories, *Medical Laboratory Assistants, *Radiographers, Rating Scales, Records (Forms), Space Utilization

The major purpose of this guide is to develop the necessary information for the writing of educational specifications to house medical x-ray technician programs. The guide is also designed to: (1) assist planners in the formation of creative housing solutions for desired educational programs, (2) prevent important considerations from being overlooked in the facility planning process, and (3) encourage logical and systematic facility planning. The guide is organized under four major parts: (1) Introduction, a discussion of purposes, assumptions, recent trends, and guiding principles, (2) The Instructional Program, information on medical x-ray technician training objectives and the kings of programs to implement them, (3) Distinct Types of Instructional Areas, the actual space desired to house the programs, and (4) Annotated Bibliography, a list of reference sources. A related document is "A Guide to Systematic Planning for Vocational and Technical Schools" (VT 007 825). (MU)

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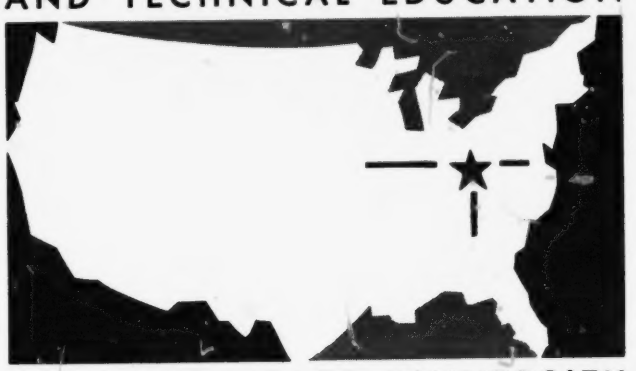
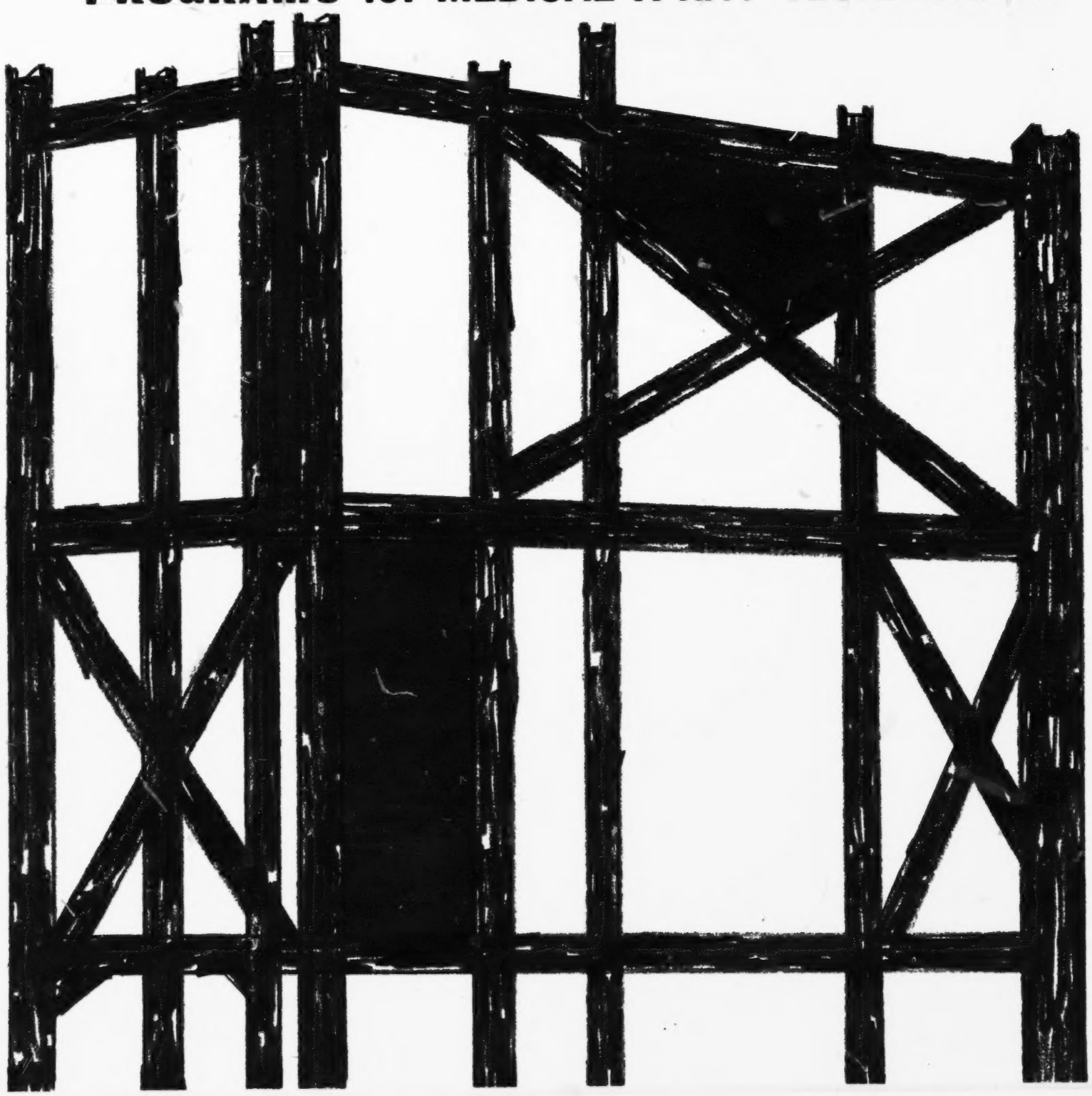
AND TECHNICAL EDUCATION



THE OHIO STATE UNIVERSITY
1900 Kenny Rd., Columbus, Ohio, 43210

RESEARCH 31

A GUIDE FOR PLANNING FACILITIES FOR OCCUPATIONAL PREPARATION PROGRAMS for MEDICAL X-RAY TECHNICIANS



VT008055

The Center for Vocational and Technical Education has been established as an independent unit on The Ohio State University campus with a grant from the Division of Comprehensive and Vocational Education Research, U. S. Office of Education. It serves a catalytic role in establishing consortia to focus on relevant problems in vocational and technical education. The Center is comprehensive in its commitment and responsibility, multidisciplinary in its approach, and interinstitutional in its program.

The major objectives of The Center follow:

1. To provide continuing reappraisal of the role and function of vocational and technical education in our democratic society;

2. To stimulate and strengthen state, regional, and national programs of applied research and development directed toward the solution of pressing problems in vocational and technical education;

3. To encourage the development of research to improve vocational and technical education in institutions of higher education and other appropriate settings;

4. To conduct research studies directed toward the development of new knowledge and new applications of existing knowledge in vocational and technical education;

5. To upgrade vocational education leadership (state supervisors, teacher educators, research specialists, and others) through an advanced study and inservice education program;

6. To provide a national information retrieval, storage, and dissemination system for vocational and technical education linked with the Educational Resources Information Center located in the U. S. Office of Education.

RESEARCH SERIES NO. 31

INTERIM REPORT
GRANT NO. OEG-3-7-000158-2037

A GUIDE FOR PLANNING FACILITIES FOR OCCUPATIONAL PREPARATION PROGRAMS FOR MEDICAL X-RAY TECHNICIANS

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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APRIL 1969

This publication was prepared pursuant to a grant with the Office of Education, U.S. Department of Health, Education and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their judgment in professional and technical matters. Points of view or opinions do not, therefore, necessarily represent official Office of Education position or policy.

FOREWORD

One of the most fundamental concerns in planning for vocational and technical education facilities is that of assuring that educational requirements dictate the nature of the facilities. Other concerns include planning a sufficiently adaptable and flexible structure to permit needed modifications and programmatic changes over the lifetime of the building. Experiences have shown that adequate manuals and guide materials can provide substantial assistance in planning educational facilities. This document is a guide for planning facilities for occupational preparation programs for medical X-ray technicians. The information recorded in the guide is to be used in the preparation of educational specifications.

The guide lists a series of pivotal questions about the educational program to be offered. The answers to these program questions bear directly on the numbers and kinds of instructional areas needed in the contemplated facilities. After program decisions are recorded, the guide provides for the description of instructional areas needed to meet program requirements. Much of the material is presented in a checklist format which allows for consideration of alternatives in facility planning.

The guide was designed for use by any person or groups of persons responsible for planning medical X-ray technology facilities. It is anticipated that knowledgeable persons such as medical X-ray technology instructors, state supervisors, university school plant planners, and local administrators will find the guide a useful planning tool. The guide can also be used for instructional purposes at universities, colleges, seminars, and institutes.

This guide is the ninth in a series being developed by The Center. Subsequent guides will be published for dental technology. The first eight guides developed were in the fields of home economics, machine trades, data processing, business and office occupations, laboratory animal science, electrical technology, automotive services, and metallurgy. All guides follow the general format developed by The Center project staff and M. J. Conrad, head, Administration and Facilities Unit, College of Education, The Ohio State University. Vocational educators should also refer to *A Guide to Systematic Planning for Vocational and Technical Schools*.

The Center for Vocational and Technical Education, The Ohio State University, worked cooperatively with James D. MacConnell, Frank Brunetti, Joseph Hannon, Edwin Rios, and Clarke Schiller at the School Planning Laboratory, School of Education, Stanford University, in preparing this planning guide. Center project staff members were Richard F. Meckley, Ivan E. Valentine, and Zane McCoy.

The Center is grateful to the many individuals and groups whose assistance and suggestions led to the successful conclusion of the project.

Robert E. Taylor, Director
The Center for Vocational
and Technical Education

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PART I

INTRODUCTION

PURPOSE OF GUIDE

The major purpose of this guide is to develop the necessary information for the writing of educational specifications to house medical X-ray technician programs.

In addition to the major purpose of providing important and comprehensive information to be incorporated in educational specifications, the guide is also designed to:

- Assist planners in the formation of creative housing solutions for desired educational programs.
- Prevent important considerations from being overlooked in the facility planning process.
- Encourage logical and systematic facility planning.

ORGANIZATION OF GUIDE

The facility planning guide is organized under four major headings or parts:

Part I (Introduction) is a discussion of the major purpose, the underlying assumptions, recent instructional trends, and the guiding principles.

Part II (The Instructional Program) gives important information on medical X-ray technician training objectives and the kinds of programs which will be organized to implement them.

Part III (Distinct Types of Instructional Areas to be Provided) describes in detail the actual spaces desired to house the program.

Part IV is an annotated bibliography of reference sources which offer a more detailed treatment of the various phases of facility planning.

UNDERLYING ASSUMPTIONS

Important assumptions were made in the preparation of this guide. They were:

- Major educational program decisions have or are being made. Content of instruction has been determined through educational surveys, advisory committees, school board study, etc. Instructional methods have been determined by qualified professors, instructors and other appropriate staff members. To assure adequate educational program planning the guide will ask important questions which may serve as guidelines to such planning.

- A cooperative and collaborative relationship has been established with knowledgeable local agencies who are aware of economic, political, and social conditions which must be taken into account in short- and long-range educational planning.

- Educational, economic, political, and social planning has revealed the approximate numbers and kinds of students (school-age and adult) to be served by the proposed school. Such information has been provided by enrollment projections, census tract data, student interest studies, etc.

- The information recorded in this document will be used in the preparation of educational specifications for use by an architect(s) in facility design.

- Sufficient funds are or can be made available to support both the provision of facilities and the operation of the desired occupational preparation programs.

RECENT INSTRUCTIONAL TRENDS

- Expanded programs to reach not only the average and those who are college bound, but also the unusually gifted, the physically handicapped, the mentally retarded, and the culturally disadvantaged are needed and being provided by occupational preparation programs.

- Cooperation among instructors in developing interdisciplinary units or courses is increasing. Cooperative instruction is encouraged and facilitated by the proximity of instructional and work areas where the teachers can plan together and produce instructional materials.

- Mobile equipment and convenient space for storing it is making the same space available for many purposes and resulting in more effective and efficient use of space.

- Mechanical and electronic teaching aids are being utilized to a greater degree by instructors in occupational preparation programs. To some extent, the effective use of such

devices depends upon the accessibility and convenience of storage.

GUIDING PRINCIPLES

In planning facilities to house occupational preparation programs, it is suggested that educational program and facility decisions be consistent with the following guiding principles.

- The educational program is the basis for planning space and facilities.
- Space and facilities should be planned to accommodate changes in the educational program.
- The program should be planned to serve the needs of a variety of groups in the community.
- Space and facilities for the program can be extended through the use of community resources.
- Safe and healthful housing must be provided for all students.
- Space and facilities for occupational preparation programs should be considered in context with the total educational program of the institution and the community.

PART II

THE INSTRUCTIONAL PROGRAM

In Part II of the guide, important instructional program decisions with respect to basic program features, objectives, and needed information on occupational preparation programs to be housed are recorded.

BASIC PROGRAM FEATURES

Basic features of the educational program are determined greatly by a school or department's educational philosophy. A philosophy of education provides a base from which program objectives and teaching and learning activities designed to meet these objectives can be derived. In the final analysis, it is the kinds of teaching and learning activities to be carried on which should determine facility needs.

In this section, planners have an opportunity to express basic program features which will serve as guidelines for the planned occupational preparation programs for X-ray technicians.

Indicate below the relative degree of emphasis to be placed on each of the program features stated by circling the appropriate number. The scale provided for this purpose ranges from 1 for major emphasis, 2 for some emphasis, 3 for slight emphasis, to N for no emphasis. This same scale will be used frequently throughout the planning guide.

1 major emphasis
2 some emphasis
3 slight emphasis
N no emphasis

1. Purpose of program

   a. A purpose of the program is to develop skills of working with modern technological equipment in the field of medical technology. 1 2 3 N

1 major emphasis
2 some emphasis
3 slight emphasis
N no emphasis

b. A purpose of the program is to prepare students for entry into further training programs. The nature of this training is:

_____
_____
_____
_____ 1 2 3 N

c. Other program purposes:
1) _____
2) _____
3) _____
4) _____

2. Students

a. Student admission to the program is on the basis of selective criteria which include:
1) _____
2) _____
3) _____
4) _____

b. The program will place emphasis on skill acquisition. 1 2 3 N

c. The program will place emphasis on the learning of theory. 1 2 3 N

d. Students will have freedom of movement and access to learning materials. 1 2 3 N

e. Students will be encouraged to act independently. 1 2 3 N

f. Students will be provided with cooperative work experience outside the school. 1 2 3 N

g. Other basic program features in relation to students:
1) _____
2) _____
3) _____
4) _____

3. Instruction

a. The instructional approach may be single discipline-medical X-ray technology as opposed to interdisciplinary (humanities, science, etc.). If not a single discipline approach, describe the interdisciplinary approach and the discipline involved.

_____
_____
_____
_____ 1 2 3 N

b. Cooperative or team instruction will be used. If this mode of instruction is to

1 major emphasis
2 some emphasis
3 slight emphasis
N no emphasis

be extensively emphasized, describe in general terms.

_____
_____
_____
_____

Yes No

c. Community resources will be utilized in instruction. If a high emphasis is to be placed on use of community resources, describe some of these resources.

_____
_____
_____

1 2 3 N

d. Instruction flexibility is required. If a high emphasis is to be placed on instructional flexibility please describe the kinds of flexibility desired.

_____
_____
_____

1 2 3 N

e. Other basic program features important to the planned instructional program:

1) _____
_____
2) _____
_____
3) _____
_____
4) _____
_____
_____

EDUCATIONAL OBJECTIVES

Educational objectives are often identified as goals or outcomes of the educational program. An objective should describe a desired educational outcome that is consistent with a school's philosophy.

Objectives are important to both the planner and the architect since they determine the school's program and related activities. They provide important implications which, when translated into facilities, can enhance the desired program. Thus it becomes imperative to clearly establish the program objectives prior to embarking on educational specifications and building design.

The purpose of this part of the guide is to bring together elements in a way as to provide direction and understanding for the planner and the architect.

Space is provided to indicate degree of emphasis by circling the appropriate number for each of the objectives. The scale provides a purpose range from 1 for major emphasis, to N for no emphasis.

1 major emphasis
2 some emphasis
3 slight emphasis
N no emphasis

1. To prepare individuals for entry into gainful employment 1 2 3 N

2. To motivate and recruit capable and qualified students to enroll in post-high school programs 1 2 3 N

3. To provide pre-professional educational training for students who plan to enter colleges and universities 1 2 3 N

4. To permit individuals to retrain or return and continue professional training 1 2 3 N

5. *Medical X-ray technician:* The courses in medical X-ray training emphasize acquisition of knowledge, the development of understanding, attitudes, and skills relevant to the medical X-ray field. Learning activities and experiences are organized to enable students to develop occupational competencies. Subject matter is coordinated with field, laboratory, and work experiences. Throughout medical X-ray training emphasis is placed on orientation to the medical profession.

   a. *Anatomy and physiology:* instruction in values, mainly the study of the skeletal system with some study of the respiratory system, circulation system, digestive tract, reproduction system and endocrine glands. 1 2 3 N
   b. *X-ray techniques:* instruction related to use of X-ray equipment, taking X-rays, developing and processing X-rays, and examining X-rays. 1 2 3 N
   c. *X-ray training:* instruction concerns patient-technician relationships and patient positioning. 1 2 3 N
   d. *Clinical training:* advanced training in X-ray procedures; working with actual patients occurs in clinical settings, e.g., hospitals. 1 2 3 N

6. Other educational program objectives:

   a. _____
   _____

b. _____

c. _____

d. _____

PROGRAM CONTENT AREAS

This guide is designed to assist in the planning of facilities for an occupational preparation program for medical X-ray technicians.

In addition to professional training, the courses or units emphasize acquisition of knowledge and the development of understanding, attitudes, and skills relevant to personal, home, and family life.

In occupational preparation, the courses or units emphasize the student's acquisition of knowledge and the development of understandings, attitudes, and skills relevant to occupational preparation. Learning activities and experiences are organized to enable students to develop competencies essential for entry into occupations, to further training, or to acquire new or additional competencies for upgrading their job entry level.

Instruction is usually given in discrete subject areas or courses. Subject matter is coordinated with appropriate field, laboratory, and work experience. Programs of occupational preparation for the most part, can be classified under the four headings: 1) scientific; 2) general; 3) laboratory and 4) clinical.

These four content areas relate directly to the professional field of service and can be used to categorize most occupational preparation programs. However, students in these programs often elect or are required to take courses in subjects such as English, mathematics, and physical education. For example, a student in training to become a medical X-ray technician might take the following courses or units:

Courses	Content Areas
American History	Academic
Biology	Science
English	Academic
Physical Education I	Physical Education

The concept of content areas is used because different disciplines require specific types of instructional facilities and equipment.

- Scientific
- General
  - Science (e.g., physics, chemistry, biology)
  - English, mathematics, and social studies
  - Music (e.g., band, chorus, and choir)

Physical Education
Other (This category is used in the event that a course or unit to be offered will not fit into any of the above content areas.)

- Laboratory
- Clinical

PLANNING INSTRUCTIONAL AREAS BY MODES OF LEARNING

The planning of instructional areas for occupational preparation facilities can be substantially aided through utilization of the concept of modes of learning. Learning can be divided into three distinct modes--reaction learning, interaction learning, and action learning

Reaction learning usually occurs in an instructional area designed for lecture and demonstration and is characterized by activities which tend to be largely teacher-centered with the central focus on lecturing. Student activities include listening, observing, and the taking of notes. Group size may vary from one to a hundred. The number of students has little effect on the learning experience if proper technological aids such as television, microphones, projectors and the like are used. Student activities are relatively passive in reaction learning.

Lecture/demonstration areas can be used commonly for reaction learning in all subject areas. For example, in planning facilities for diverse occupational preparation programs: e.g., medical secretary and medical assistant training, the planner should bear in mind that reaction learning for students in both programs can occur in the same kind of space. This means that facility planning should be done in terms of the total program rather than its fractional parts. In many instances, lecture/demonstration areas can be shared. Where a great deal of facility sharing is expected the planner should consider the relative merits of optimum location within the building and the advisability of clustering various instructional areas.

Interaction learning usually occurs in a seminar instructional area and is characterized by both teacher and learner participating as both listener and speaker. This mode of learning, of course, must occur in groups; however, sociological research suggests these groups should not exceed 15 to 18 persons for optimal effectiveness. Active interaction of all students generally requires a longer time span than reaction learning.

Seminar areas, like lecture/demonstration areas, are usually designed for common use by all vocational service areas. The same considerations which were outlined for lecture/demonstration areas also apply to seminar areas.

Action learning which usually occurs in a laboratory instructional area allows the individual student to learn by doing. Students learn on an individual basis, but may function in a group setting. In more flexible types of educational programs, students are scheduled for laboratory work on an individual basis. Since action learning involves overt action by individual students, the teacher's role is largely that of a consultant to the learner.

Laboratory areas are more specialized than lecture/demonstration areas used for reaction learning and seminar areas used for interaction learning. Since laboratory areas are designed to facilitate the learning of specific skills, there is less likelihood of sharing such areas by students in various vocational training programs. Wherever common elements of skill instruction are found among training programs, the possibility of sharing and clustering laboratory spaces can be both expedient and economical.

SPECIALIZED AND MULTI-USE OF INSTRUCTIONAL AREAS

The relative amounts of time to be spent by students in a given vocational program in reaction, interaction, and action learning has definite implications for the number and kind of spaces to be provided. These time considerations combined with decisions on the degree of specialization versus multi-use help determine the nature of facilities required. Since most vocational programs have concentrated on action learning experiences, facilities designed for a particular vocational program have seldom provided adequate reaction and interaction facilities because of the limited utilization of such spaces. However, if the learning activities in any vocational program are broken down into the modes of learning, it will be noted that reaction and interaction spaces are the same regardless of the vocational area. Therefore, by providing common reaction and interaction spaces for all vocational programs, the most modern technological aids can be justified which, in most cases, will permit lectures, demonstrations and other group reaction learning experiences for groups larger than typically used in vocational education programs. Not only will group reaction learning be improved but more time will become available for the professional staff to work with individuals and small groups in interaction and action learning activities.

Scheduling group reaction and interaction learning experiences into specialized facilities permits complete flexibility in the use of action learning laboratories on an open individualized basis since students would no longer need to be scheduled into the action learning laboratories on a specific class basis. This will permit 100 percent room utilization of the action learning laboratories and also permit the introduction of differentiated staff assignments into vocational education.

The open laboratory concept also permits the planned sharing of certain specialized equipment which may be required by two or more vocational programs.

NOTE: THE FOLLOWING SECTIONS OF THE GUIDE (PAGES 14-33) WILL ASSIST THE PLANNER IN MAKING MATHEMATICAL DETERMINATIONS OF THE NUMBER OF INSTRUCTIONAL AREAS NEEDED TO HOUSE THE DESIRED PROGRAM. IF THE NUMBER OF INSTRUCTIONAL AREAS REQUIRED ARE ALREADY KNOWN, THE PLANNER MAY NOW PROCEED TO FORM E, PAGE 34. IF, HOWEVER, MATHEMATICAL DETERMINATIONS ARE TO BE MADE, ALL FORMS SHOULD BE COMPLETED AS ACCURATELY AS POSSIBLE.

OCCUPATIONAL PREPARATION PROGRAMS TO BE OFFERED

Information on the medical X-ray technician program is entered on a separate Form A, page 17. Directions for completing this form appear on pages 14 and 15.

INSTRUCTIONS FOR COMPLETING FORM A
BASIC PROGRAM INFORMATION

Item 1
Occupational Preparation Program--Enter here the name of the occupational program to be offered.

Item 2
Yearly Enrollment--Enter here the projected maximum number of students to be enrolled yearly in the program.

Item 3
Nature of Students--Underline all categories which apply to the students to be enrolled in the program.

Item 4
Weeks of Instruction per Year--Enter here the number of weeks per year the school will be open for instruction, e.g., 38 weeks.

Item 5
Total Weekly Periods or Modules--Enter here the total number of periods or modules (if modular scheduling is to be used) per week available for instructional purposes for each student. Do not count periods or modules scheduled for lunch and other non-instructional purposes.

Column 6
Courses of Instruction--List the courses or units of instruction to be offered either on a required or elective basis for the occupational preparation program.

Column 7
Content Area--Opposite each course of instruction, enter the appropriate content area as presented on page 11.

Column 8
Total Course Enrollment--Opposite each course of instruction enter the projected maximum student enrollment.

Column 9
Maximum Group Size for Reaction Learning--Opposite each course or unit of instruction, enter the maximum group size in number of students for reaction (lecture/demonstration) type learning.

Column 10
Estimated Weekly Periods or Modules of Reaction Level Learning--Opposite each course or unit of instruction, enter the estimated number of periods or modules per week to be devoted to reaction learning per student.

Column 11
Weekly Group-Periods or Modules (Lecture/Demonstration)--To compute weekly group-periods or modules, divide the entry in Column 8 by the entry in Column 9 and round up to the nearest whole number. Then multiply the whole number by the entry in Column 10.

Column 12
Maximum Group Size for Interaction Learning--Opposite each course or unit of instruction, enter the maximum group size in number of students for interaction (seminar) type learning.

Column 13
Estimated Weekly Periods or Modules of Interaction Level Learning--Opposite each course or unit of instruction, enter the estimated number of periods or modules per week to be devoted to interaction learning per student.

Column 14
Weekly Group-Periods or Modules (Seminar)--To compute weekly group-periods or modules, divide the entry in Column 8 by the entry in Column 12 and round up to the nearest whole number. Then multiply the whole number by the entry in Column 13.

Column 15
Maximum Group Size for Action Learning--Opposite each course or unit of instruction, enter the maximum group size in number of students for action (laboratory) type learning.

Column 16
Estimated Weekly Periods or Modules of Action Level Learning--Opposite each course or unit of instruction, enter the estimated number of periods or modules per week to be devoted to action learning per student.

Column 17
Weekly Group-Periods or Modules (Laboratory)--To compute weekly group-periods or modules, divide the entry in Column 8 by the entry in Column 15 and round up to the nearest whole number. Then multiply the whole number by the entry in Column 16.

SAMPLE FORM A

PROGRAM INFORMATION

1. Occupational Preparation Program *Medical X-ray Technician/2 Year Sequence*
2. Yearly Enrollment *40*
3. Nature of Students (underline appropriate categories): a. day school[1]; b. night school[1]; c. school age; d. adults; e. males; f. females; other (specify) _____
4. Weeks of Instruction per Year *38*
5. Total Weekly Periods or Modules *40*

Courses of Instruction[2]	Content Areas	Total Course Enrollment	Maximum Group Sizes, Estimated Weekly Periods or Modules and Calculated Group-Modules or Period-Modules by Levels of Learning								
			REACTION*			INTERACTION**			ACTION***		
			Maximum Group Size	Weekly Periods or Modules	Weekly Group-Periods or Modules	Maximum Group Size	Weekly Periods or Modules	Weekly Group-Periods or Modules	Maximum Group Size	Weekly Periods or Modules	Weekly Group-Periods or Modules
(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
X-ray Tech. 1	*Gen.*	*20*	*20*	*3*	*3*						
X-ray Tech. 2	*Lab*	*20*	*20*	*3*	*3*						
Radiogr.Pos.Pro.1	*Sci.*	*20*	*40*	*2*	*2*				*6*	*8*	*32*
Radiogr.Pos.Pro.2	*Lab*	*20*	*40*	*2*	*2*				*6*	*8*	*32*
Radiogr.Pos.Pro.3	*Lab*	*20*	*40*	*2*	*2*				*6*	*8*	*32*
Rad.Exp./Darkrm.	*Lab*	*20*	*20*	*3*	*3*				*12*	*12*	*24*
Prac.X-ray Exp.	*Lab*	*20*	*20*	*3*	*3*	*10*	*1*	*2*	*8*	*3*	*9*
Clin.Intern. 1[3]	*Clin.*	*20*									
Clin.Intern. 2[3]	*Clin.*	*20*									
Clin.Intern. 3[3]	*Clin.*	*20*									
X-ray Physics[3]	*Lab*	*20*									
Other (specify)											

[1] If both day and night schools are offered, fill out separate forms for each.

[2] The above identifies a sample of professional course requirements only. Other academic requirements for the associate science or similar degrees must be added.

[3] Clinical internship and X-ray physics to be conducted in local hospitals.

*(LECTURE/DEMONSTRATION); **(SEMINAR); ***(LABORATORY)

FORM A

PROGRAM INFORMATION

1. Occupational Preparation Program _____

2. Yearly Enrollment _____

3. Nature of Students (underline appropriate categories): a. day school[1]; b. night school[1]; c. school age; d. adults; e. males; f. females; other (specify) _____

4. Weeks of Instruction per Year _____

5. Total Weekly Periods or Modules _____

Courses of Instruction[2]	Content Areas	Total Course Enrollment	Maximum Group Sizes, Estimated Weekly Periods or Modules and Calculated Group-Modules or Period-Modules by Levels of Learning								
			REACTION*			INTERACTION**			ACTION***		
			Maximum Group Size	Weekly Periods or Modules	Weekly Group-Periods or Modules	Maximum Group Size	Weekly Periods or Modules	Weekly Group-Periods or Modules	Maximum Group Size	Weekly Periods or Modules	Weekly Group-Periods or Modules
(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)

FORM A

[1]If both day and night schools are offered, fill out separate forms for each.

[2]The above identifies a sample of professional course requirements only. Other academic requirements for the associate science or similar degrees must be added.

*(LECTURE/DEMONSTRATION); **(SEMINAR); ***(LABORATORY)

FORM A

PROGRAM INFORMATION

1. Occupational Preparation Program _____

2. Yearly Enrollment _____

3. Nature of Students (underline appropriate categories): a. day school[1]; b. night school[1]; c. school age; d. adults; e. males; f. females; other (specify) _____

4. Weeks of Instruction per Year _____

5. Total Weekly Periods or Modules _____

Courses of Instruction[2]	Content Areas	Total Course Enrollment	Maximum Group Sizes, Estimated Weekly Periods or Modules and Calculated Group-Modules or Period-Modules by Levels of Learning								
			REACTION*			INTERACTION**			ACTION***		
			Maximum Group Size	Weekly Periods or Modules	Weekly Group-Periods or Modules	Maximum Group Size	Weekly Periods or Modules	Weekly Group-Periods or Modules	Maximum Group Size	Weekly Periods or Modules	Weekly Group-Periods or Modules
(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)

[1] If both day and night schools are offered, fill out separate forms for each.

[2] The above identifies a sample of professional course requirements only. Other academic requirements for the associate science or similar degrees must be added.

*(LECTURE/DEMONSTRATION); **(SEMINAR); ***(LABORATORY)

FORM A

PROGRAM INFORMATION

1. Occupational Preparation Program _____

2. Yearly Enrollment _____

3. Nature of Students (underline appropriate categories): a. day school[1]; b. night school[1]; c. school age; d. adults; e. males; f. females; other (specify) _____

4. Weeks of Instruction per Year _____

5. Total Weekly Periods or Modules _____

Courses of Instruction[2] (6)	Content Areas (7)	Total Course Enrollment (8)	Maximum Group Sizes, Estimated Weekly Periods or Modules and Calculated Group-Modules or Period-Modules by Levels of Learning								
			REACTION*			INTERACTION**			ACTION***		
			Maximum Group Size (9)	Weekly Periods or Modules (10)	Weekly Group-Periods or Modules (11)	Maximum Group Size (12)	Weekly Periods or Modules (13)	Weekly Group-Periods or Modules (14)	Maximum Group Size (15)	Weekly Periods or Modules (16)	Weekly Group-Periods or Modules (17)

FORM A

[1] If both day and night schools are offered, fill out separate forms for each.

[2] The above identifies a sample of professional course requirements only. Other academic requirements for the associate science or similar degrees must be added.

*(LECTURE/DEMONSTRATION); **(SEMINAR); ***(LABORATORY)

FORM A

PROGRAM INFORMATION

1. Occupational Preparation Program _____

2. Yearly Enrollment _____

3. Nature of Students (underline appropriate categories): a. day school[1]; b. night school[1]; c. school age; d. adults; e. males; f. females; other (specify) _____

4. Weeks of Instruction per Year _____

5. Total Weekly Periods or Modules _____

Courses of Instruction[2]	Content Areas	Total Course Enrollment	Maximum Group Sizes, Estimated Weekly Periods or Modules and Calculated Group-Modules or Period-Modules by Levels of Learning								
			REACTION*			INTERACTION**			ACTION***		
			Maximum Group Size	Weekly Periods or Modules	Weekly Group-Periods or Modules	Maximum Group Size	Weekly Periods or Modules	Weekly Group-Periods or Modules	Maximum Group Size	Weekly Periods or Modules	Weekly Group-Periods or Modules
(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)

FORM A

[1] If both day and night schools are offered, fill out separate forms for each.

[2] The above identifies a sample of professional course requirements only. Other academic requirements for the associate science or similar degrees must be added.

*(LECTURE/DEMONSTRATION); **(SEMINAR); ***(LABORATORY)

PART III

DISTINCT TYPES OF INSTRUCTIONAL AREAS TO BE PROVIDED

QUANTITATIVE FACILITY NEEDS

The number of instructional areas to house the programs described in Part II (The Instructional Program) are recorded in this section of the guide.

As indicated in Part II, there are three principal types of instructional areas used to accommodate educational programs. They are:

Lecture/demonstration areas--used principally for group reaction learning.

Seminar areas--used principally for group interaction learning.

Laboratory areas--used principally for group or individual action learning.

In addition to these instructional areas, there are, of course, other school-wide auxiliary areas such as instructional materials centers, language laboratories, gymnasiums, and auditoriums which are part of the overall school plan. Requirements for such facilities are calculated as a part of total school planning and are not made in this guide.

Forms B, C, and D can be used to compute the number of lecture/demonstration, seminar, and laboratory areas required for the medical X-ray technician program.

Results of the computations on Forms B, C, and D are entered on Form E which is a summary of total instructional area requirements for the medical X-ray technician program.

In the event that instructional area requirements are already determined (e.g., it has been decided that one combination laboratory and lecture/demonstration area will be provided) the information can be recorded directly on Form E without making the computations on Forms B, C, and D.

After the number of instructional areas are determined on Form E, information can then be recorded in the following section of the guide concerning the nature of these spaces.

INSTRUCTIONS FOR COMPLETING FORM B
LECTURE/DEMONSTRATION AREA REQUIREMENTS BY CONTENT AREAS

Column 1

Content Area--Content areas are listed in Column 1.

Column 2

Total Enrollment--To obtain total enrollment for content areas, find the total enrollment for each content area as indicated in Columns 7 and 8 of Form A(s) for all occupational preparation programs.

Column 3

Maximum Group Size--Opposite each content area, enter the maximum group size desired for a lecture/demonstration area to serve the content area (Form A, Column 9).

Column 4

Total Weekly Periods or Modules--Opposite each content area, enter the total periods or modules per week the school will be open for day school instruction. This entry will be identical to the number recorded for Item 5, Form A.

Column 5

Total Weekly Reaction Group-Periods or Modules--Opposite each content area, enter the total group periods or modules per week to be devoted to reaction learning as indicated in Column 11 of Form A(s) for all occupational preparation programs.

Column 6

Lecture/Demonstration Areas Required--Opposite each content area, enter the quotient of Item 5 divided by Item 4. Round up to the nearest hundredth.

Column 7

Adjusted Lecture/Demonstration Areas Required--To adjust for scheduling difficulties which result in areas being less than 100 percent utilized, multiply the entry in Column 6 by 1.3 and enter the result, rounded up to the nearest hundredth, in Column 7 for each content area.

Column 8

Totals--Since lecture/demonstration areas, unlike laboratory areas, can be utilized by nearly all content areas, the entries in Column 7 can be added for all lecture/demonstration areas with identical maximum group sizes as entered in Column 3. For example, 8a might read 1 lecture/demonstration areas with a student capacity of 40 each.

SAMPLE FORM B

LECTURE/DEMONSTRATION AREA REQUIREMENTS BY CONTENT AREAS

Content Area (1)	Total Enrollment (2)	Maximum Group Size (3)	Total Weekly Periods or Modules (4)	Total Weekly Reaction Group-Periods or Modules (5)	Lecture/Demonstration Areas Required (5) ÷ (4) (6)	Adjusted Lecture/Demonstration Areas Required (6) X 1.3 (7)
Scientific	*20*	*40*	*40*	*2*	*.05*	*.07*
General	*20*	*20*	*40*	*3*	*.08*	*.11*
Laboratory	*100*	*40*	*40*	*13*	*.33*	*.43*
Clinical*	*0*					
Others (specify)						

SAMPLE FORM B

*See Form A.

(8) Totals (Figures in Column 7 can be added together for areas with same student capacity as entered in Column 3). Round off total to next higher whole number.

a. *1* lecture/demonstration areas with a student capacity of *40*.
b. _____ lecture/demonstration areas with a student capacity of _____.
c. _____ lecture/demonstration areas with a student capacity of _____.
d. _____ lecture/demonstration areas with a student capacity of _____.

FORM B

LECTURE/DEMONSTRATION AREA REQUIREMENTS BY CONTENT AREAS

Content Area (1)	Total Enrollment (2)	Maximum Group Size (3)	Total Weekly Periods or Modules (4)	Total Weekly Reaction Group-Periods or Modules (5)	Lecture/Demonstration Areas Required (5) ÷ (4) (6)	Adjusted Lecture/Demonstration Areas Required (6) X 1.3 (7)
Scientific						
General						
Laboratory						
Clinical*						
Others (specify)						

*See Form A.

(8) Totals (Figures in Column 7 can be added together for areas with same student capacity as entered in Column 3). Round off total to next higher whole number.

a. _____ lecture/demonstration areas with a student capacity of _____.
b. _____ lecture/demonstration areas with a student capacity of _____.
c. _____ lecture/demonstration areas with a student capacity of _____.
d. _____ lecture/demonstration areas with a student capacity of _____.

INSTRUCTIONS FOR COMPLETING FORM C
SEMINAR AREA REQUIREMENTS BY CONTENT AREAS

Column 1
Content Area--Content areas are listed in Column 1.

Column 2
Total Enrollment--To obtain total enrollment for content areas, find the total enrollment for each content area indicated in Columns 7 and 8 of Form A(s) for all occupational preparation programs.

Column 3
Maximum Group Size--Opposite each content area, enter the maximum group size desired for a seminar area to serve the content area (Form A, Column 12).

Column 4
Total Weekly Periods or Modules--Opposite each content area, enter the total periods or modules per week the school will be open for day school instruction. This entry will be identical for all content areas and identical to the number recorded for Item 5, Form A.

Column 5
Total Weekly Interaction Group-Periods or Modules--Opposite each content area, enter the total group periods or modules per week to be devoted to interaction learning as indicated in Column 14 of Form A(s) for all occupational preparation programs.

Column 6
Seminar Areas Required--Opposite each content area, enter the quotient of Item 5 divided by Item 4. Round up to the nearest hundredth.

Column 7
Adjusted Seminar Areas Required--To adjust for scheduling difficulties which result in areas being less than 100 percent utilized, multiply the entry in Column 6 by 1.3 and enter the result, rounded up to the nearest hundredth, in Column 7 for each content area.

Column 8
Totals--Since seminar areas, unlike laboratory areas, can be commonly utilized by nearly all content areas, the entries in Column 8 can be added for all seminar areas with identical maximum group sizes or entered in Column 3. For example, 8a might read 1 seminar areas with a student capacity of 10 each.

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SAMPLE FORM C

SEMINAR AREA REQUIREMENTS BY CONTENT AREAS

Content Area (1)	Total Enrollment (2)	Maximum Group Size (3)	Total Weekly Periods or Modules (4)	Total Weekly Interaction Group-Periods or Modules (5)	Seminar Areas Required (5) ÷ (4) (6)	Adjusted Seminar Areas Required (6) X 1.3 (7)
Scientific	*0*					
General	*0*					
Laboratory	*20*	*10*	*40*	*2*	*.05*	*.07*
Clinical	*0*					
Others (specify)						

(8) Totals (Figures in Column 7 can be added together for areas with same student capacity as entered in Column 3.) Round up total to next higher whole number.

a. *1* seminar areas with a student capacity of *10*.
b. _____ seminar areas with a student capacity of _____.
c. _____ seminar areas with a student capacity of _____.
d. _____ seminar areas with a student capacity of _____.

FORM C

SEMINAR AREA REQUIREMENTS BY CONTENT AREAS

Content Area (1)	Total Enrollment (2)	Maximum Group Size (3)	Total Weekly Periods or Modules (4)	Total Weekly Interaction Group-Periods or Modules (5)	Seminar Areas Required (5) ÷ (4) (6)	Adjusted Seminar Areas Required (6) X 1.3 (7)
Scientific						
General						
Laboratory						
Clinical						
Others (specify)						

FORM C

(8) Totals (Figures in Column 7 can be added together for areas with same student capacity as entered in Column 3.) Round up total to next higher whole number.

a. _____seminar areas with a student capacity of _____.
b. _____seminar areas with a student capacity of _____.
c. _____seminar areas with a student capacity of _____.
d. _____seminar areas with a student capacity of _____.

INSTRUCTIONS FOR COMPLETING FORM D
LABORATORY AREA REQUIREMENTS BY CONTENT AREA

Column 1
Content Area--Content areas are listed in Column 1.

Column 2
Total Enrollment--To obtain total enrollment for content areas, find the total enrollment for each area as indicated in Columns 7 and 8 of Form A for all occupational preparation programs.

Column 3
Maximum Group Size--Opposite each content area, enter the maximum group size desired for a laboratory area to serve the content area (Form A, Column 15).

Column 4
Total Weekly Periods or Modules--Opposite each content area, enter the total periods or modules per week the school will be open for day school instruction. This entry will be identical to the number recorded for Item 5, Form A.

Column 5
Total Weekly Action Group-Periods or Modules--Opposite each content area, enter the total group periods or modules per week to be devoted to action learning as indicated in Column 17 of Form A(s) for all occupational preparation programs.

Column 6
Laboratory Areas Required--Opposite each content area, enter the quotient of Item 5 divided by Item 4. Round up to the nearest hundredth.

Column 7
Adjusted Laboratory Areas Required--To adjust for scheduling difficulties which result in areas being less than 100 percent utilized, multiply the entry in Column 6 by 1.3 and enter the result, rounded up to the nearest hundredth, in Column 7, for each content area.

SAMPLE FORM D

LABORATORY AREA REQUIREMENTS BY CONTENT AREAS

Content Area (1)	Total Enrollment (2)	Maximum Group Size (3)	Total Weekly Periods or Modules (4)	Total Weekly Action Group-Periods or Modules (5)	Lab Areas Required (5) ÷ (4) (6)	Adjusted Lab Areas Required (6) X 1.3 (7)
Scientific	*20*	*6*	*40*	*32*	*.80*	*1.04*
General	*0*					
Laboratory	*80*	*12*	*40*	*97*	*2.43*	*3.16*
Clinical	*0*					
Others (specify)						

SAMPLE FORM D

FORM D

LABORATORY AREA REQUIREMENTS BY CONTENT AREAS

Content Area (1)	Total Enrollment (2)	Maximum Group Size (3)	Total Weekly Periods or Modules (4)	Total Weekly Action Group-Periods or Modules (5)	Lab Areas Required (5) ÷ (4) (6)	Adjusted Lab Areas Required (6) X 1.3 (7)
Scientific						
General						
Laboratory						
Clinical						
Others (specify)						

FORM D

FORM E

SUMMARY OF FACILITY REQUIREMENTS FOR MEDICAL X-RAY TECHNICIAN OCCUPATIONAL PREPARATION PROGRAMS

1. Lecture/demonstration areas for reaction learning (see Form B) e.g., 1 areas with a student capacity of 40 each.

   a. _____ area(s) with a student capacity of _____.
   b. _____ area(s) with a student capacity of _____.
   c. _____ area(s) with a student capacity of _____.
   d. _____ area(s) with a student capacity of _____.

2. Seminar areas for interaction learning (see Form C)

   a. _____ area(s) with a student capacity of _____.
   b. _____ area(s) with a student capacity of _____.

3. Laboratory areas for action learning (see Form D)

   *_____ medical X-ray laboratory area(s) with a student capacity of _____.

4. Multi-use areas

   If any of the specialized areas above are to be combined as multi-purpose spaces, indicate the combinations desired.

   a. _____
   b. _____
   c. _____
   d. _____

*This laboratory requires a clinical setting; it may be programmed in the institution or in clinical facilities available in the community.

QUALITATIVE FACILITY NEEDS

This section records information concerning the required instructional areas. Special forms are provided for describing the nature of lecture/demonstration areas, seminar areas, laboratory areas, and auxiliary areas. For each type of instructional area, information in the following categories should be considered.

1. The relationship of the area to other instructional areas (specialized versus multi-purpose utilization of space).

2. The number of areas needed.

3. The activities of students and teachers in the instructional area.

4. The spatial relationships within the area and its relationships to other instructional areas.

5. The furniture and equipment required for the area.

6. The environmental factors required for the area.

7. The special utility services required for the area.

8. The minimum space requirements for the area.

FORM F

DESCRIPTION OF LECTURE/DEMONSTRATION AREA(S) TO BE USED PRINCIPALLY FOR GROUP REACTION LEARNING

1 major emphasis
2 some emphasis
3 slight emphasis
N no emphasis

1. The lecture/demonstration area(s) should be planned:

a. As independent unit(s)	Yes	No
b. In combination with _____ laboratory area(s) (specify)	Yes	No
c. In combination with seminar area(s)	Yes	No
d. As an area within a single multi-use space	Yes	No

2. Number of lecture/demonstration areas required for the desired program (see Form E) _____

3. Student and instructor activities in this space. Indicate the extent to which each of the activities listed below will occur.

a. Listening to lectures	1	2	3	N
b. Observing demonstrations	1	2	3	N
c. Taking notes	1	2	3	N
d. Viewing films, slides, overhead projections, etc.	1	2	3	N
e. _____	1	2	3	N
f. _____	1	2	3	N

4. Spatial relationships. Indicate the extent to which the lecture/demonstration area(s) should be accessible to the:

a. Instructional materials center	1	2	3	N
b. Building entrance	1	2	3	N
c. Delivery area	1	2	3	N
d. Other instructional areas				
1) _____	1	2	3	N
2) _____	1	2	3	N
3) _____	1	2	3	N
e. Other building areas				
1) _____	1	2	3	N
2) _____	1	2	3	N
3) _____	1	2	3	N

5. Furniture and equipment

a. Student seating			
1) Individual desks and chairs	P	A	NA*

*Code: P = Preferred; A = Acceptable ; NA = Not Acceptable. This scale is used frequently on the following pages.

a) Number of desks and chairs required
b) Provision for storage — Yes / No

2) Permanent-type desk — P / A / NA
a) Number required
b) Provision for storage — Yes / No

3) Desk and chair combination — P / A / NA
a) Number required
b) Provision for storage — Yes / No

4) Tables and chairs — P / A / NA
a) Number of tables required
b) Number of chairs required
c) Provision for storage — Yes / No

5) Auditorium-type seating — P / A / NA
Number of seats required

b. Stage — Yes / No
1) Permanent type — P / A / NA
2) Portable type — P / A / NA
The approximate area in square feet desired

c. Sound amplifying system — P / A / NA

d. Controls for regulating light intensity — P / A / NA

e. Lectern
1) Permanent type — P / A / NA
2) Portable type — P / A / NA
3) Provision for storage — Yes / No

f. Projection screen
1) Built-in type — P / A / NA
2) Portable type — P / A / NA
3) Approximate dimensions
4) Provision for storage — Yes / No

g. Other equipment required for lecture/ demonstration area(s) are:
1) _____
2) _____
3) _____
4) _____

6. Environmental factors

a. Aesthetic. Factors to be considered in the aesthetic domain are colors, light, style of architecture, design and the like. Indicate any special aesthetic considerations important to the planning of the lecture/ demonstration area(s).

_____
_____
_____

b. Aerial. Factors to be considered in this category include air temperature, radiant temperature, relative humidity, and ventilation. Indicate any special considerations important to the planning of the lecture/demonstration area(s).

F

_____
_____
_____

c. Visual. A properly controlled and balanced visual environment is important. The visual environment affects such things as accuracy in perception, attention to tasks, and speed of performance. Indicate any special factors which should be taken into account in planning the visual environment of the lecture/demonstration area(s).

_____
_____
_____

d. Sonic. Factors to be considered in this category include such things as acoustical requirements and sound systems. Indicate any special consideration important to the planning of the lecture/demonstration area(s).

_____
_____
_____

e. Safety. In planning a school building, safety for students and instructors is of prime concern. Indicate any special safety considerations which have implications for design of the lecture/demonstration area(s).

_____
_____
_____
_____

7. Vertical instructional surfaces

a. Chalkboard	Yes	No
1) Wall-mounted	P A	NA
Number of lineal feet	_____	
2) Portable	P A	NA
Provision for storage	Yes	No
b. Tack board	Yes	No
Number of lineal feet	_____	
c. Pegboard	Yes	No
Number of lineal feet	_____	

8. Special utility services required

a. Electricity		
1) Projection equipment	Yes	No
2) Sound amplifying equipment	Yes	No
3) Electrical needs for other equipment (specify)		
a) _____		
b) _____		
c) _____		
d) _____		

b. Other utility needs for the lecture/demonstration area
   1) _____
   2) _____
   3) _____
   4) _____

9. The minimum space requirement in square feet for each lecture/demonstration area _____. (The planner should be aware of any state or local regulation or recommendations concerning floor space requirements.)

10. Other important factors to be considered in the planning of the lecture/demonstration area(s) are:

FORM G

DESCRIPTION OF SEMINAR AREA(S) TO BE USED PRINCIPALLY FOR GROUP INTERACTION LEARNING

1 major emphasis
2 some emphasis
3 slight emphasis
N no emphasis

1. The seminar area(s) should be planned:

a. As independent unit(s)	Yes	No
b. In combination with _____ laboratory area(s) (specify)	Yes	No
c. In combination with lecture/demonstration area(s)	Yes	No
d. As an area within a single multi-use space	Yes	No

2. The number of seminar area(s) required for the desired program (see Form E) _____

3. Student and instructor activities in this space. Indicate the extent to which each of the activities listed below will occur.

a. Small group discussions	1	2	3	N
b. Viewing films, slides, overhead projections, etc.	1	2	3	N
c. Demonstrating	1	2	3	N
d. Reporting	1	2	3	N
e. Working on projects	1	2	3	N
f. _____	1	2	3	N
g. _____	1	2	3	N

4. Spatial relationships. Indicate the extent to which the seminar area(s) should be accessible to the:

a. Instructional materials center	1	2	3	N
b. Building entrance	1	2	3	N
c. Delivery area	1	2	3	N
d. Other instructional areas				
1) _____	1	2	3	N
2) _____	1	2	3	N
3) _____	1	2	3	N
4) _____	1	2	3	N
e. Other building areas				
1) _____	1	2	3	N
2) _____	1	2	3	N
3) _____	1	2	3	N

5. Furniture and equipment

a. Seminar table	Yes	No
1) Number required	_____	

2) Seating for how many persons
3) Permanent type — P A NA
4) Portable type — P A NA
5) Provision for storage — Yes No

b. Chairs
1) Number required
2) Straight-back type — P A NA
3) Folding type — P A NA
4) Provision for storage — Yes No

c. Other equipment required for seminar area(s):
1) _____
2) _____
3) _____
4) _____

6. Environmental factors

a. Aesthetic. Factors to be considered in the aesthetic domain are colors, light, style of architecture, design and the like. Indicate any special aesthetic considerations important to the planning of seminar area(s).

_____
_____
_____

b. Aerial. Factors to be considered in this category include air temperature, radiant temperature, relative humidity, and ventilation. Indicate any special considerations important to the planning of the seminar area(s).

_____
_____
_____

c. Visual. A properly controlled and balanced visual environment is important. The visual environment affects such things as accuracy in perception, attention to tasks, and speed of performance. Indicate any special factors which should be taken into account in planning the visual environment of the seminar area(s).

_____
_____
_____

d. Sonic. Factors to be considered in this category include such things as acoustical requirements and sound system. Indicate any special considerations important to the planning of the seminar area(s).

_____
_____
_____

e. Safety. In planning a school building, safety for students and instructors is of prime concern. Indicate

any special safety considerations which have implications for design of the seminar area(s).

_____
_____
_____
_____

7. Vertical instructional surfaces

a.	Chalkboard	Yes		No
	1) Wall-mounted	P	A	NA
	Number of lineal feet	_____		
	2) Portable	P	A	NA
	Provision for storage	Yes		No
b.	Tack board	Yes		No
	Number of lineal feet	_____		
c.	Pegboard	Yes		No
	Number of lineal feet	_____		

8. Special utility services required

a.	Electricity		
	1) Projection equipment	Yes	No
	2) Sound amplifying equipment	Yes	No
	3) Electrical needs for other equipment (specify)		
	a) _____		
	b) _____		
	c) _____		
	d) _____		
b.	Other utility needs for the seminar area(s)		
	1) _____		
	2) _____		
	3) _____		
	4) _____		

9. Minimum space requirement in square feet for each seminar area _____. (The planner should be aware of any state or local regulations or recommendations concerning floor space requirements.)

10. Other important factors to be considered in the planning of the seminar area(s) are:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

FORM H

DESCRIPTION OF MEDICAL X-RAY LABORATORY AREA(S) TO BE USED PRINCIPALLY FOR ACTION LEARNING

1 major emphasis
2 some emphasis
3 slight emphasis
N no emphasis

1. The medical X-ray laboratory area(s) should be planned:

a. As independent unit(s)	Yes	No
b. In combination with _____ laboratory area(s) (specify)	Yes	No
c. In combination with seminar area(s)	Yes	No
d. In combination with lecture/demonstration area(s)	Yes	No
e. As an area within a single multi-use space	Yes	No

2. Student capacity required for scheduled activities (see Form E) _____

3. Student and instructor activities in various space divisions within the medical X-ray laboratory area(s). Indicate the extent to which each activity will occur.

Laboratory area				
1) Introduction to theoretical and practical aspects of X-ray technology	1	2	3	N
2) Learns medical terminology relevant to X-ray technology	1	2	3	N
3) Studies basic X-ray physics	1	2	3	N
4) Learns X-ray protection of patients and personnel	1	2	3	N
5) Learns radiographic positioning and procedures	1	2	3	N
6) Learns darkroom procedures and film processing	1	2	3	N
7) Studies principles of radiographic exposures	1	2	3	N
8) Learns to evaluate films	1	2	3	N
9) Learns equipment maintenance	1	2	3	N
10) Studies office procedures and departmental administration	1	2	3	N
11) Studies intra-oral radiography	1	2	3	N
12) Studies pediatric radiography	1	2	3	N
13) Learns radiation therapy	1	2	3	N
14) Engages in clinical X-ray experience	1	2	3	N
15) Learns professional ethics and legal problems	1	2	3	N
16) Develops human relation skills and patient/technician relationships	1	2	3	N
17) Studies topographic anatomy	1	2	3	N

1 major emphasis
2 some emphasis
3 slight emphasis
N no emphasis

18)	Studies the human body, the skeletal system, and how it functions	1	2	3	N
19)	_____	1	2	3	N
20)	_____	1	2	3	N

4. Spatial relationships. Indicate the extent to which spaces should be accessible within the medical X-ray laboratory area(s).

a.	Laboratory to:				
1)	Instructional area	1	2	3	N
2)	Instructional aids	1	2	3	N
a)	TV/closed, open, circuit	1	2	3	N
b)	Overhead projector	1	2	3	N
c)	Movie projection	1	2	3	N
d)	Chalkboards, models, charts, etc.	1	2	3	N
3)	Stand-up work area	1	2	3	N
4)	Supply storage area	1	2	3	N
5)	Independent study area	1	2	3	N
6)	Individual student storage area	1	2	3	N
a)	Supplies and materials	1	2	3	N
b)	Instruments and equipment	1	2	3	N
c)	Projects	1	2	3	N
7)	Instructor's area	1	2	3	N
8)	Wet, dry (electrical) student study area	1	2	3	N
9)	Utility areas	1	2	3	N
a)	Water	1	2	3	N
b)	Gas	1	2	3	N
c)	Electrical	1	2	3	N
d)	Compressed air	1	2	3	N
b.	Other important spatial relationships within the medical X-ray laboratory area(s):				
	Viewing room	1	2	3	N
	Darkroom	1	2	3	N
	Exposed film storage	1	2	3	N
	_____	1	2	3	N
	_____	1	2	3	N
	_____	1	2	3	N
c.	Medical X-ray laboratory area(s) to:				
1)	Instructional materials center	1	2	3	N
2)	Instructors' offices	1	2	3	N
3)	Centralized storage	1	2	3	N
4)	Administration complex	1	2	3	N
5)	Classrooms	1	2	3	N
6)	Other related labs	1	2	3	N
7)	Delivery area	1	2	3	N
8)	Teacher preparation area	1	2	3	N
9)	Student research area/references/library material	1	2	3	N

1 major emphasis
2 some emphasis
3 slight emphasis
N no emphasis

10) Individual project development area (e.g., extended time project work) 1 2 3 N
11) Lavatory facilities 1 2 3 N

5. Furniture and equipment related to medical X-ray laboratory:

a. Teacher demonstration table — Yes No
1) Number required _____
2) Fixed/portable _____
3) Provision for storage — Yes No
4) Utilities
a) Electricity--variable AC/DC — Yes No
b) Vacuum — Yes No
c) Water (hot/cold) — Yes No
d) Drain/sink — Yes No
e) Gas--natural — Yes No
f) T.V. reception/transmission — Yes No
g) Lighting (Rheostat) — Yes No
h) Rear screen projection — Yes No
5) Further description
_____
_____

b. Teachers' desk(s) — Yes No
1) Number required _____
2) Provision for storage — Yes No
3) Further description
_____
_____

c. Teachers' chairs — Yes No
1) Number required _____
2) Further description
_____
_____

d. File cabinets — Yes No
1) Number required _____
2) Legal size — Yes No
3) Letter size — Yes No
4) Further description
_____
_____

e. Work counter — Yes No
1) Height/length/depth _____
2) Storage — Yes No
3) Acid resistant — Yes No
4) Utilities
a) Electricity — Yes No
b) Gas — Yes No
c) High level illumination — Yes No

	d) Water (hot/cold)	Yes		No
	e) Drain/sink	Yes		No
	5) Further description			
	_____			
	_____			
f.	Student chairs	Yes		No
	1) Number required	_____		
	2) Folding type	P	A	NA
	3) Movable/fixed	P	A	NA
	4) Provision for storage	Yes		No
	5) Further description			
	_____			
	_____			
g.	Student laboratory stations	Yes		No
	1) Number required	_____		
	2) Fixed	P	A	NA
	3) Movable	P	A	NA
	4) Stand-up/sit-down	P	A	NA
	5) Seating	Yes		No
	6) Seating--movable/fixed	P	A	NA
	7) Utilities			
	a) Voltage--variable AC/DC	Yes		No
	b) Vacuum	Yes		No
	c) Drain/sink	Yes		No
	d) Gas	Yes		No
	e) Water (hot/cold)	Yes		No
	f) T.V. reception/transmission	Yes		No
	g) Lighting--variable/accent	Yes		No
	8) Further description			
	_____			
	_____			
h.	Display unit	Yes		No
	1) Portable/glass doors, sliding variety	Yes		No
	2) Adjustable shelves	Yes		No
	3) Ventilation provided	Yes		No
	4) Same height as demonstration table will enlarge work area	P	A	NA
	5) Further description			
	_____			
	_____			
i.	Cabinet (film records)	Yes		No
	1) Movable/fixed	_____		
	2) Number required	_____		
	3) Size	_____		
	4) Further description			
	_____			
	_____			
j.	Articulated skeleton	Yes		No
	1) Number required	_____		
	2) Further description			
	_____			
	_____			
k.	Plastic torso model	Yes		No
	1) Number required	_____		

2) Further description

_____

_____

1. Models — Yes No
   1) Number required _____
   2) Further description

_____

_____

m. Guerneys — Yes No
   1) Number required _____
   2) Further description

_____

_____

n. Wheelchairs — Yes No
   1) Number required _____
   2) Further description

_____

_____

o. Footstools — Yes No
   1) Number required _____
   2) Further description

_____

_____

p. Blankets — Yes No
   1) Number required _____
   2) Further description

_____

_____

q. Lead aprons — Yes No
   1) Number required _____
   2) Size _____
   3) Further description

_____

_____

r. Film cassettes — Yes No
   1) Number required _____
   2) Further description

_____

_____

s. Viewboxes — Yes No
   1) Number required _____
   2) Size _____
   3) Wall-mounted — Yes No
   4) Recessed — Yes No

t. X-ray table (energized) — Yes No
   1) Number required _____
   2) Further description

_____

_____

u. X-ray table (not energized) — Yes No
   1) Number required _____
   2) Further description

_____

_____

v. X-ray training machine — Yes No
   1) Number required _____
   2) Further description
   _____
   _____

w. Control unit — Yes No
   1) Number required _____
   2) Further description
   _____
   _____

x. X-ray machine — Yes No
   1) Number required _____
   2) Further description
   _____
   _____

y. X-ray machine (portable) — Yes No
   1) Number required _____
   2) Further description
   _____
   _____

z. Fluroscope — Yes No
   1) Number required _____
   2) Further description
   _____
   _____

6. Darkroom equipment

   a. Utilities
      1) Sink/water (hot/cold) — Yes No
      2) Electricity--variable AC/DC — Yes No
      3) Safety lights — Yes No
      4) Ventilation — Yes No
      5) Other
      _____
      _____

   b. Entrance maze — Yes No
   c. Outside warning light — Yes No
   d. Film viewer — Yes No
      1) Number required _____
      2) Further description
      _____
      _____

   e. Film drier — Yes No
      1) Number required _____
      2) Further description
      _____
      _____

   f. Work counter (acid resistant) — Yes No
      Further description
      _____
      _____

   g. Processing tank — Yes No
      1) Number required _____

2) Size _____
3) Further description

_____

_____

h. Automatic processing machine — Yes / No
1) Number required _____
2) Size _____
3) Further description

_____

_____

7. Other important factors to be considered in the medical X-ray laboratory are:

a. *Radiation protection*
b. *Film storage area/cabinet*
c. *Hot/cold water and sink*
d. *Liquid supply storage/solution processing and mixing*
e. _____
f. _____
g. _____

FORM I

ADDITIONAL PLANNING CONSIDERATIONS

Other important factors to be considered in the overall planning and design of instructional areas for the medical X-ray technician occupational preparation program(s) are:

PART IV

ANNOTATED BIBLIOGRAPHY

GENERAL FACILITY PLANNING

American Association of School Administrators. Planning America's School Buildings. Washington, D.C.: The Association, 1960.

Contributors to this publication were teachers, supervisors, administrators, architects, engineers, school board members, and school plant planning specialists. In addition to background material on school house construction, the book deals with specific topics including school surveys, analysis and computation of space and facility needs, enrollment projections, building designs, site selection, finance, and building maintenance and operation. Many pictures and illustrations are found, along with sample forms and outlines, which can be used in the facility planning process. No special consideration is given to unique problems faced in the planning for vocational and technical education facilities.

Boles, Harold W. Step by Step to Better School Facilities. New York: Holt, Rinehart, and Winston, 1965.

A textbook on overall planning procedures for new and improved school facilities. The typical topics (school surveys, building planning, site selection and acquisition, architectural planning, contracting for construction, and the equipping and furnishing of buildings) are covered. The only mention of vocational schools is on page 270 where the author quotes from another source:

> Vocational training should be de-emphasized in the schools since this training often becomes obsolete before it can be used; also, special "trade" and "vocational" schools should be discontinued, unless the vocational curriculum is liberal in approach and broad in character. Such schools are often used as dumping grounds for students who are not wanted elsewhere and often no more than custodial care is provided for them. When more is provided, the skills taught are frequently too partial in nature.

Conrad, M. J. Four Steps to New Schools. Columbus, Ohio: Educational Administration and Facilities Division of the Bureau of Educational Research and Service. The Ohio State University.

A book prepared for the inexperienced school planner. The author emphasizes that a school building is an educational tool and should be designed to do the job it is intended to do. The four steps discussed are: 1) district-wide building survey; 2) educational planning; 3) architectural planning and construction; and 4) moving in and settling down. A glossary of important terms used in plant planning is located in the back of the book.

Conrad, M. J.; Wohlers, E. E.; and Griggs, Norman. School Plant Planning: An Annotated Bibliography. Columbus, Ohio: The Administration and Facilities Unit, School of Education, The Ohio State University, 1968.

A compilation of references in the following categories: general references; periodicals; overview of school plant field; district wide building survey; educational planning; the architect and his work; moving in and settling down; and related topics.

Finchum, R. N. Extended Use of School Facilities. Washington, D.C.: U. S. Department of Health, Education, and Welfare, 1967.

This manual is intended to assist officials of school districts who are planning programs for maximum use of school properties and who must develop policies and regulations for efficient management of such programs. Various schedules of facility use are illustrated for nine different school systems.

Green, Alan C. Educational Facilities With New Media. Washington, D.C.: Department of Audiovisual Instruction, National Education Association, 1966.

This work is designed to meet the needs of three distinct groups interested in providing educational facilities. Report A: "A Guide for Policy Makers" is directed to boards, administrators, planning committees, and institutional planners. Report B: "A Guide for the Design of Professions" is designed for architects, planners, and design specialists and planning committees; and Report C: "A Technical Guide" is intended for design-architects, engineers, equipment and furniture suppliers, and media specialists.

National Council on School House Construction. NCSC Guide for Planning Plants. East Lansing, Michigan: The Council, 1964.

A basic reference on school plant planning and construction for use by superintendents, school board members, school plant planners, state department of education personnel, local school system officials, collegiate institutions, architects, lay advisory groups, and graduate students. Major topics

covered are: planning and programming educational plants; spaces and equipment for learning; non-instructional systems; space organization and economy and resources. Much attention is given to plant planning through a description of a survey technique used to determine and satisfy school plant needs for a community. Site selection, kinds of instructional spaces, sonic, termal, and visual environments, and best use of natural and plant resources are also treated.

North Carolina. Department of Public Instruction. A Digest of Educational Planning. Raleigh, North Carolina: The Department.

The contents of this book include a description of what educational planning is, when it is done, who does it, and how it is done. The three steps of planning are identified as 1) identification and analysis of educational and facility needs, 2) adapting and implementing plant improvement programs, and 3) completing and evaluating a process of the educational planning.

North Carolina. Department of Public Instruction. The Division of School Planning. School Design. Raleigh.

Basic principles of school design is the thrust of this publication. It focuses on the interrelationship of patterns of school activities, organization of activities on the site, design potentials for various sites, and the building design data necessary for communicating the school's needs to the architect.

School Planning Laboratory. Spectrum of Electronic Teaching Aids in Education. Stanford, California: Stanford University, 1965.

This publication seeks to suggest which learning functions can be served electronically to symbolize the nature and progressive complexity of each electronic system, and finally to estimate budgets which will provide for adequate systems in relation to engineering and warranty costs.

Strevell, Wallace H., and Burke, Arvid J. Administration of the School Building Program. New York: McGraw-Hill Book Company, Inc., 1959.

A comprehensive textbook on the administration of the school plant program. The book is organized into three major parts. Part I - "Policy Decisions" deals with school building needs studies and long-range planning. Part 2 - "Program Recommendations" deals with local study of plant needs, evaluation of existing plant, determination of additional plant needs, site selection and development, and the preparation of educational specifications. Part 3 - "Project Administration" is concerned with the financial aspects of a building program and with public relations. There is a brief mention of the objectives of vocational education as contrasted with the objectives of general education on page 12.

The Cost of a Schoolhouse. New York: Educational Facilities Laboratories, 1960.

This book deals with the cost of a schoolhouse and the process of planning and financing it. It provides median costs for various building elements, designates individual responsibilities in process of building, and discusses arrangement of space and environmental factors.

VOCATIONAL-TECHNICAL FACILITY PLANNING

American Vocational Association. Developing Educational Specifications for Vocational and Practical Arts Facilities. Washington, D.C.: The Association.

The purpose of this publication is to reduce the broad principles and processes of school plant planning to those most applicable to vocational and practical arts education. Effective techniques for developing educational specifications are suggested. The committee provides a sequential treatment of program and administrative considerations, desired space and educational program, special site arrangement features, special physical aspects of building, and the financial requirements for the project.

Calder, Clarence R. Modern Media for Vocational-Technical Education. Connecticut: State Department of Education, 1967.

A study of related literature on programmed instruction, instructional films, instructional television, and learning from various instructional media. It analyzes new instructional media approaches used at North Carolina's Fundamental Learning Laboratories System, and the integrated experience approach at Oakland Community College.

Chase, William W.; Browne, Johnny W., and Russo, Michael. Basic Planning Guide for Vocational and Technical Education Facilities. Washington, D.C.: Department of Health, Education, and Welfare, U. S. Government Printing Office, 1965.

A general guide that describes important steps to be followed in the planning for and construction of vocational and technical education facilities. Important topics covered are: the impact of the Vocational Education Act of 1963; surveys of area educational needs; use of consultant services; basic planning considerations; educational specifications; general planning; and school construction cost and outlay. Sample floor plans and picture illustrations of vocational schools are included.

McKee, Robert L. and Ripley, Katherine J. The Documentation of Steps to Establish a Technical College and the Evaluation of PERT as a Planning Tool for Educators. Bailey's Crossroads, Virginia: Unpublished report, 1966.

An account of the procedures followed in the establishment of a technical college within a period of less than 90 days. The entire planning process and implementation is described along with the PERT technique which was applied. The author concluded the PERT (Program Evaluation and Review Technique) was effective in assisting the planners in reaching their objectives within a short period of time.

Stanford University. Trends in Facility Design-Vocational-Technical Continuing Information Program. Stanford, California: School of Education, 1966.

The pamphlet emphasizes the need for a total flexibility concept in school building. Consideration is given to the use of building components to provide flexibility in space, lighting, air-conditioning, sewage system, and the like.

U. S. Department of Health, Education, and Welfare. New Ideas and Construction for Vocational Education. Washington, D.C.: Unpublished, 1967.

A report on new trends in the construction of vocational education facilities. Among topics covered are occupational clusters, teaching techniques such as micro-teaching and educational television, facilities for handicapped children, educational parks, and unique problems faced by large city school systems. Special consideration is given to maximum utilization of vocational education facilities on an around-the-clock basis.

Valentine, Ivan E. and Conrad, M. J. Progress Report: Vocational-Technicial Facilities Project. Columbus, Ohio: The Center for Vocational and Technical Education, The Ohio State University, 1967.

A report which relates the thinking of six outstanding consultants on various topics relating current trends in vocational-technical education and facility planning. Reviews the work of a local consortium consisting of three Center vocational specialists, three school plant planners, three representatives from the State Department of Education, three local school officials, and three practicing architects in defining problems, clarifying issues, suggesting approaches to organizing planning guides, and establishing guidelines for a series of facility planning guides in selected vocational and technical subject areas.

Wohlers, A. E. A Manual for Planning a Secondary School Building (Vocational Education). Columbus, Ohio: The Administration and Facilities Unit, School of Education, The Ohio State University, Pamphlet C-14.

A general facility planning guide for programs of vocational education. Principal topics covered include: 1) number of teaching stations; 2) types of teaching stations; 3) equipment needs; and 4) floor areas required. The planning manual also deals with spatial relationships of teaching facilities

and the utilization of auxiliary areas such as libraries, cafeterias, and administrative suites. Planners using the guide are directed to complete checklists and fill-in blanks with the necessary information pertinent to vocational facility planning.

MEDICAL TECHNOLOGY FACILITY PLANNING

George Washington University, School of Medicine. Design for Medical Education. Washington, D. C., 1965.

This report describes the steps taken by the university to translate its educational objectives, philosophy, and techniques into laboratory, classroom, and clinic. In addition to an existing hospital, this university identifies five functional groupings of supporting facilities which include: 1) Commons, 2) Medical Sciences Unit, 3) Resources Unit, 4) University Clinics Unit, and 5) Doctor's Office Building. The reports present basic considerations in the planning of the first four of these units. The design studies accompanying each unit have application to general learning environments.

Harrell, G. T.; Hamilton, J. M.; and Butt, A. "A Multidiscipline Student Teaching Laboratory: Incorporation in a Single Building Design." Journal of Medical Education, 39 (1964), 828-837.

The authors discuss advantages of multidiscipline of laboratories for conventional or integrated curricula. Included are recommended space requirements for students and faculty. The separation of basic student activities places emphasis on individual student progress and multi-use of laboratory space. Floor plans and photographs are included.

Library Study Committee of the Association of American Medical Colleges. The Health Services Library. Report to the National Library of Medicine, January 1967. Reprinted in Journal of Medical Education, August 1967.

A comprehensive report concerned with the most effective role the library can plan in health education, the policy and situational decisions to be considered in planning new or renovated library facilities, the kinds of spaces the health services library of the future will need, and where the library planner can turn for help. Also included are sections on external and internal space relationships, general seating requirements, special rooms, and staff spaces. The appendices include structural and physical guidelines for planning and an extensive annotated bibliography.

National Health Council and American Association of Junior Colleges. A Guide for Health Technology Program Planning. New York, N. Y., 1967.

The first section contains analysis of program development, development of curriculum essentials, and requisite resources for a selected health area. The second section of the guide presents general information, background for health facility administrators and the health practitioner association. This section concludes with two checklists, one for health facilities and another for the health practitioner association. There is brief mention in the appendices of the associations concerned with program development, referral lists of source agencies, and statements of needs, role and responsibilities of collaborative institutions.

Planning of Radiotherapy Facilities. World Health Organization Technical Report Series, No. 328. Geneva: World Health Organization, 1966.

This publication contains a detailed description of staff requirements and functions in X-ray technology and radiotherapy, equipment needs and specifications, space requirements and relationships, and protection materials and design. Also included is a complete listing of the types of required spaces and recommended square footage per person.

Snow, D. L. Space Planning Principles for Biomedical Research Laboratories. U. S. Public Health Service, Publication No. 1025. Washington, D.C.: United States Government Printing Office, 1963.

A step-by-step outline that describes the stages in planning biomedical research laboratories. Programing methods, space and utility requirements, laboratory furniture lay-out, and size and shape are discussed. Data from a National Institutes of Health Survey of randomly selected research laboratories is presented and analyzed in terms of planning research facilities. Laboratory lay-outs are included.

U. S. Department of Health, Education and Welfare, Public Health Service. Procedures for Areawide Health Facility Planning. No. 930, 1963.

Presents procedures and techniques for areawide planning of hospitals and related health facilities. This publication amplifies the recommendations made by the joint committee of the American Hospital Association and the Public Health Service in "Areawide Planning for Hospitals and Related Health Facilities." Intended as a guide for areawide planning councils, it describes procedures for organizing a planning council, the initial stages of operation, and data collection.

U. S. Department of Health, Education and Welfare, Public Health Service. Medical Education Facilities. Washington, D. C.: 1964.

2

Outlines the role and responsibilities of the medical school complex. This manual discusses planning considerations and provides an architectural guide. In addition to material presented in previous editions, this manual incorporates information on the teaching hospital which has application to school environments.

U. S. Department of Health, Education and Welfare, Public Health Service. Publications of the Division of Hospitals and Medical Facilities. Washington, D. C., 1966.

A bibliography which lists and describes the publications available under the Hospital and Medical Facilities Series programs of the Public Health Service.

U. S. Department of Health, Education and Welfare, Public Health Service. Hospital and Nursing Home Equipment Planning Guide. Washington, D. C., 1967.

This manual is the 17th edition of an equipment list to be used as a guide by those who determine equipment needs for hospitals of various sizes. Included are suggestions for the procedures to be followed by planners in determining the specific equipment requirements for a given facility.

PUBLICATIONS OF
THE CENTER FOR VOCATIONAL AND TECHNICAL EDUCATION

RESEARCH SERIES

no.	name of publication	cost
1	A National Survey of Vocational Education Programs for Students with Special Needs. April 1967. 89+ [14] p. ED011041	$2.00
2	The Demand for and Selected Sources of Teachers in Vocational and Technical Education, State Directory. January 1967. 31+ [51] p. ED012331	o
3	Research and Development Priorities in Technical Education. May 1967. 34 p. ED013888	o
4	Review and Synthesis of Research in Agricultural Education. August 1966. 140 p. ED011562	1.50
5	Review and Synthesis of Research in Business and Office Occupations Education. August 1966. 128 p. ED011566	o
6	Review and Synthesis of Research in Distributive Education. August 1966. 212 p. ED011565	o
7	Review and Synthesis of Research in Home Economics Education. August 1966. 104 p. ED011563	o
8	Review and Synthesis of Research in Industrial Arts Education. August 1966. 88 p. ED011564	o
9	Review and Synthesis of Research in Technical Education. August 1966. 69 p. ED011559	1.50
10	Review and Synthesis of Research in Trade and Industrial Education. August 1966. 76 p. ED011560	o
	Set of Seven Research Reviews (nos. 4-10)	10.00
11	The Emerging Role of State Education Departments with Specific Implications for Divisions of Vocational-Technical Education. 1967. ED016870	4.50
12	A Taxonomy of Office Activities for Business and Office Education. July 1968. 163 p. VT005935 RIE	2.75
13	Enlisted Men Separating from the Military Service as a Potential Source of Teachers for Vocational and Technical Schools. October 1967. 53 p. ED016131	*
14	Boost: Business and Office Education Student Training; Preliminary Report. 1967. 251 p. VT005131 RIE	3.00
18	Research Priorities in Technical Teacher Education: A Planning Model. October 1967. 48 p. ED016815	o
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21	An Evaluation of Off-farm Agricultural Occupations Materials. October 1967. 74 p. ED016853	*

LEADERSHIP SERIES

1	Report of a National Seminar on Agricultural Education, "Program Development and Research," August 9-13, 1965. 176 p. ED011036	*
2	Guidance in Vocational Education. Guidelines for Research and Practice. 1966. 181 p. ED011922	o
3	Guidelines for State Supervisors of Office Occupations Education. 1965. 84 p. VT001266 RIE	o
4	National Vocational-Technical Education Seminar on the Development and Coordination of Research by State Research Coordinating Units. 1966. 72 p. ED011042	o
5	A Report of the Business and Office Education Research Planning Conference. 1966. 116 p. ED013304	o
6	Program Development for Occupational Education. A Report of a National Seminar for Leaders in Home Economics Education, March 28-31, 1966. 118 p. ED011040	o
7	Report of a National Invitational Research Planning Conference on Trade and Industrial Teacher Education, May 23-27, 1966. 1966. 197 p. ED011043	2.00

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no.	name of publication	cost
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9	Health Occupations Education Centers: Report of a National Seminar held July 11-14, 1966. 1967. ED016823	o
10	Guidelines for Cooperative Education and Selected Materials from the National Seminar held August 1-5, 1966. 1967. 255 p. ED011044	o
11	Systems Under Development for Vocational Guidance. 1966. 60 p. ED011039	o
12	Compilation of Technical Education Instructional Materials--Supplement I. April 1967. 203 p. ED012340	3.00
13	Compilation of Technical Education Instructional Materials--Supplement II. April 1967. 242 p. ED011933	3.50
14	Educational Media in Vocational and Technical Education: Report of a National Seminar. 1967. 240 p. ED017730	o
15	Vocational-Technical Education: National Seminar Proceedings. 1968. 283 p. VT005627 RIE	3.25
16	National Program Development Institutes in Technical Education, Summer 1967: A Compilation of Selected Presentations and Instructional Materials. 194 p. VT005628 RIE	o
BIBLIOGRAPHY SERIES		
1	Implications of Women's Work Patterns for Vocational and Technical Education: An Annotated Bibliography. 1967. 25 p. ED016812	1.50
2	Worker Adjustment: Youth in Transition from School to Work: An Annotated Bibliography. 1968. 135 p. VT005631 RIE	3.25
INFORMATION SERIES		
	Abstracts of Research and Related Materials in Vocational and Technical Education. Fall 1967. Quarterly.	9.00 per year
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Instructional Material in:		
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	Agricultural Machinery--Service Occupations (Course outline and and sixteen modules) ED012761-ED012777	7.50
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	Summary of Research Findings in Off-farm Agriculture Occupations. ED015245	1.00
	Vocational and Technical Education in Agriculture for Off-farm Occupations. ED011034	.75

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